

Leveraging master data management (MDM) within a Teradata environment

More than a buzzword: MDM is a set of processes to create and maintain a clean, accurate and consistent view of reference data shared across systems. *by Mark Shainman*

The market is always abuzz with new technology enablers—the new, great IT initiative. Some of the buzzwords swirling in the market today are master data management (MDM), customer data integration (CDI) and product information management (PIM). Is MDM something totally new or is it just the re-branding of existing processes and technologies? Master data management has been defined and described in previous Teradata Magazine articles, but this article will address the technical components and capabilities of an MDM solution, and outline Teradata's MDM strategy and what it can do for your business.

Before delving too deeply into this topic, it is important to understand what master data and MDM are. Master data is data shared across operational and analytic systems and is used to classify and define transactional data. Master data is data driven by business events such as adding a new product line or changing a customer address. This is different from transactional data, which is a record of business events, such as shipments or at the point of sale (POS) during shopping events, etc.

Simply put, MDM is a set of processes to create and maintain a clean, accurate and consistent view of reference data shared across

systems (e.g., lists or hierarchies of customers, suppliers, accounts or organizational units). It is used to classify and define transactional data using a centralized integration manager, sometimes referred to as a hub. It leverages policies and procedures to access, update and manage this central resource and its coordination with other participating systems across

the enterprise. Areas such as CDI management of customer reference data and PIM management of product and supplier reference data are domain-specific subsets of MDM.

Why is MDM important?

Now that you understand what MDM is, you may question whether you actually need it.

Table: Company need for master data management

INCREASED EFFICIENCY	GREATER EFFECTIVENESS
Process simplification <ul style="list-style-type: none"> > Streamline and eliminate redundancy > Promote re-use and data quality 	Enterprise agility <ul style="list-style-type: none"> > Consistency and accuracy > Rapid process orchestration (i.e., SOA) > Meet customer mandates (i.e., RFID, GDS)
Compliance/risk management <ul style="list-style-type: none"> > Transparency of information > Reduce risks with conflicting sources 	Revenue enhancement <ul style="list-style-type: none"> > Improved data quality for up-selling/cross-selling
Supplier consolidation <ul style="list-style-type: none"> > Improve spend analytics data quality > Leverage global purchasing power 	Real time <ul style="list-style-type: none"> > Integration and synchronization with partners, suppliers, customers
Organizational speed <ul style="list-style-type: none"> > Manage expanding volume and velocity of information and data > Reduce integration burdens from mergers, acquisitions and reorganizations 	Single view <ul style="list-style-type: none"> > Consistent and holistic view across all products, channels and divisions (i.e., product, customer, financial)

All companies can benefit from an MDM solution as MDM allows companies to increase their overall efficiencies through more effective usage of existing IT and analytical systems.

Master data management can be leveraged for process simplification. When companies must look to numerous systems to find reference data and then attempt to reconcile that data, processes (e.g., new customer introduction or new product introduction) can become more complex, convoluted and error-prone. Not only will MDM streamline such processes, allowing for faster introduction of products and customers, but it will also let users eliminate redundant data and processes, making data reusable and improving overall data quality.

Many companies are currently considering the issues surrounding compliance and risk management. Numerous government regulations now require accurate and safe data storage and retrieval. The regulations extend to reference data such as customer information (especially in finance and healthcare), as well as a company's own financial information.

If a company's reference data is inaccurate, the company may be exposed to both government and private censure. If regulations require rapid retrieval and auditing of data sources, companies can reduce the overall risk of government noncompliance by leveraging an MDM solution, which can eliminate conflicting reference data sources, accurately audit reference-data distribution and increase information transparency.

Companies looking to improve supply chain efficiencies can utilize MDM to enable supplier consolidation. Master data management allows companies to reconcile supplier information contained within numerous operational systems throughout the enterprise and create a single clean list of suppliers and supplier information. This process lets companies utilize that information with analytics.

Further, companies can gain greater insight into factors such as supplier spending, allowing them to more readily utilize global purchasing

power by providing a single, consolidated and synchronized copy of supplier reference data. The supplier consolidation process can also be extended to benefit companies by enabling them to have more real-time access to that data, so they can more easily synchronize with partners, suppliers and customers. It is much simpler to create and maintain a real-time architecture when a correct, up-to-date copy of reference data is available.

Leveraging MDM also provides benefits for customer reference data. Inconsistent customer master data may cause problems such as mailings to the wrong address or multiple mailings to the same address. These errors can reduce the effectiveness of mailed promotions and customer confidence. By relying on MDM on the customer side and improving data quality surrounding customer reference data, organizations can more effectively up-sell and cross-sell to their customer base.

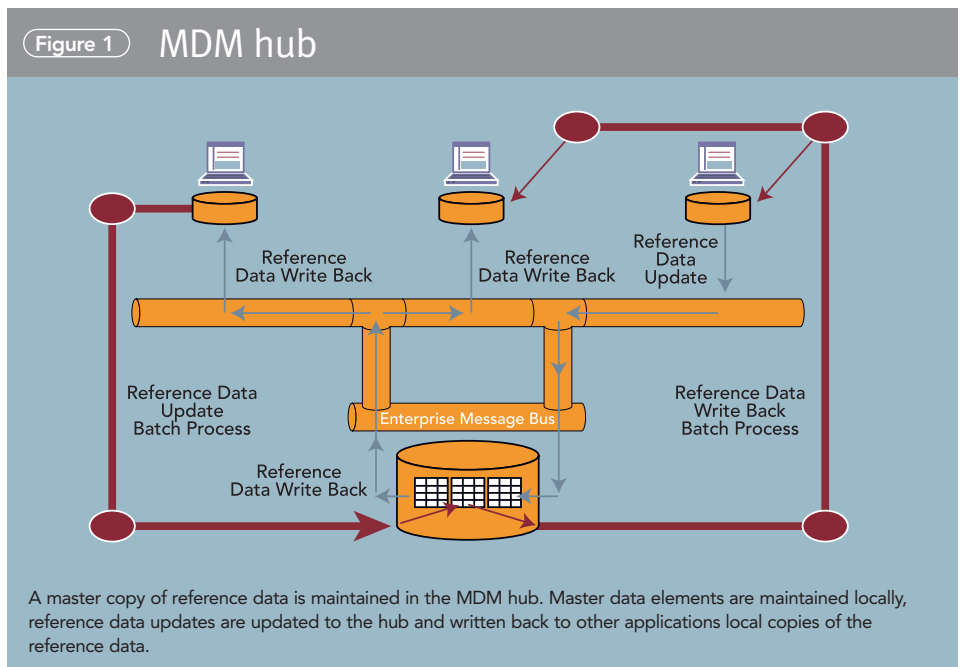
As stated earlier, MDM can help simplify processes such as new customer and product introduction, but another benefit of MDM is its ability to empower companies to improve their overall organizational speed. Having a set process and methodology in place to consoli-

date, clean and reconcile master data allows companies to more rapidly bring new applications online.

In today's environment of mergers and acquisitions, this standard process assists companies more rapidly and effectively deal with the daunting task of enterprise application and infrastructure integration and helps them to more assuredly manage their increasing data volumes.

One of the key initiatives in numerous IT organizations is the expansion of the service oriented architecture (SOA) application and computing model. Service oriented architecture's greatest benefit is providing the enterprise with the capacity to create a single service or function (such as checking credit worthiness) that can be used numerous times across multiple company domains and within numerous applications.

This service provides more rapid application development, more concise application processes and a simplification of the overall application architecture. The key point to remember with enterprise-wide SOA is that it requires a single view of master data that can be leveraged across multiple domains for process orchestration.



How do MDM applications actually work?

So now you must be fully convinced that MDM is what your company needs. It sounds great, but how does it actually work? Master data management solutions are applications and business logic that should contain five main functional groups. Within those groups, numerous individual sub-functions reside. An MDM solution should contain the ability to:

> Manage data architecture and metadata—

The MDM application will manage data models, business rules and metadata on ownership, sources, usage standards and systems of record, origin and reference. A useful MDM application should allow companies to either import an existing data model (Teradata customers could use one of the existing enterprise logical data models (LDM)) or leverage a preset general model that the MDM application provides. The application also allows the users to set up business rules (e.g., master data can be updated from application A and B, but not application C; or if an address of a customer who falls into a certain financial category has changed, then an e-mail is sent to department X).

To effectively manage the processes of synchronizing, updating, cleansing and business rules surrounding master data, MDM applications must have their own metadata repository to manage areas such as all of the metadata pertaining to data sources, ownership of reference data and specific usage standards.

> Author and extend master data—

The application allows a user to directly add or update a master data record within the repository using a direct user interface (UI). Through this UI, a company can also extend master data records to replace or augment systems of record. For example, UCCnet, the Internet-based data registry service for e-commerce companies, has a requirement to publish “X-percent recycled material.” If this information is unavailable in any existing system, a company can centrally manage its

addition through the MDM application and synchronize it with other systems.

> Manage data quality and cross-referencing—

The applications also allow for data quality management, data cleansing and setting up the cross referencing of master data elements. The capability to synchronize and update master data means nothing if that data is inaccurate and error-filled. An MDM application can perform data quality checking of new and changing master data, as well as call out to external data quality services, such as Acxiom or Fair Isaac.

The MDM application also allows for the maintenance of data integrity by allowing data in different formats to be linked to a common standard (for example, standardize/clean multiple ZIP code schemes; rationalize part numbers for planning). In a sense, it allows for multiple and different views of the same data.

> Synchronize master data—

The heart of any MDM application is its ability to synchronize master data. Most companies’ IT infrastructures include many legacy applications that will continue to be in service for years. It is impractical to think that we can rip

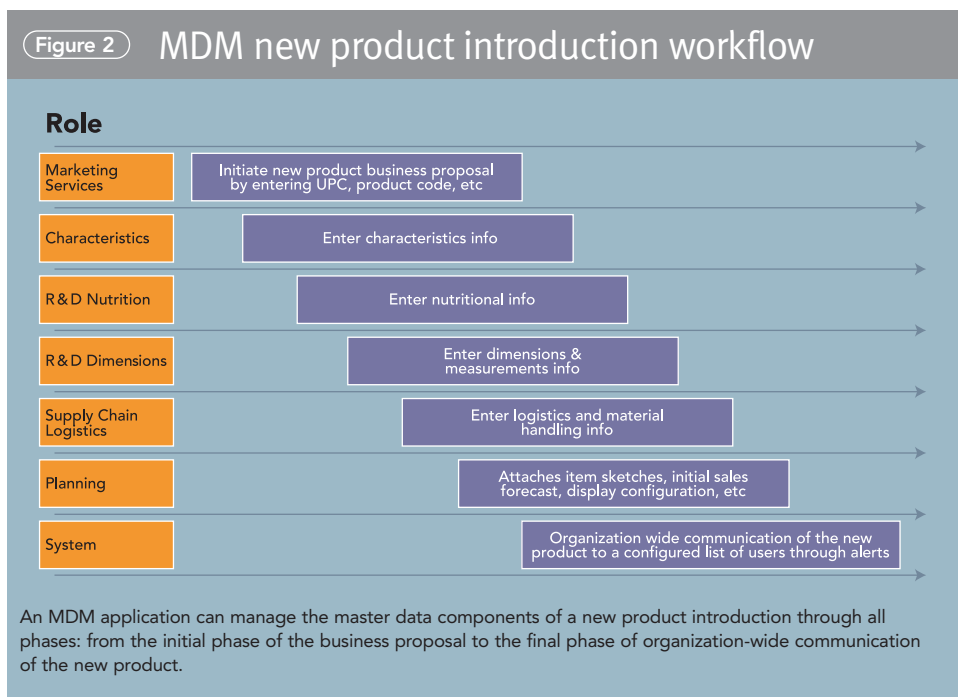
the localized master data repository out of these legacy applications and re-architect them to go against a single copy of the data.

An MDM application not only allows direct update and access of master data within a centralized repository, but also updates and propagates state changes of data attributes from one local repository to another. The process allows a local repository to update to a centralized repository, which then, in turn, synchronizes those changes out to other local repositories. (See figure 1, pg. 62.)

The MDM application allows companies to set up this synchronization process, as well as define specific business rules around the process (e.g., update of master data record X should be propagated out to applications A, B and C, or master record X can be updated from applications A and C, but not B). The synchronization process can also be granularly defined so that local copies are synchronized with global data while the ownership of the local data is still locally retained.

> Manage master data workflows—

Creating and managing master data workflows is another key function of MDM



applications. This function is especially important in processes such as new product or customer introduction, where each step of the process must be checked and the process steps controlled. In the process of new product introduction, an MDM application can manage the master data components of that product through the multiple phases: from the initial phase of the business proposal to the final phase of organization-wide communication of the new product. (See figure 2, pg. 63.)

Though individual products provide workflow management or data synchronization, MDM applications bring these functional elements together to work in conjunction with one another and enable effective MDM.

What is Teradata's MDM strategy?

Master data management is a strategic solution area for Teradata. Teradata's strategy is to provide the best solution to enable better, faster decisions by utilizing integrated enterprise data. Teradata is focused on meeting the needs

of the marketplace by delivering core capabilities surrounding the management of reference data in a single, integrated enterprise data warehouse (EDW) platform. Master data management is considered an extension of Teradata's existing active data warehousing initiative and functionality, making it uniquely suited to the Teradata platform.

The platform should be leveraged in an MDM solution as the master data repository, enabling customers to take advantage of the existing power of the Teradata data warehouse to manage master data. The following attributes make Teradata EDW a prime platform for master data:

- > Data duplication is unnecessary; a single reference version of the data already resides in the EDW
- > No separate MDM infrastructure pieces are needed; there are no separate integration pieces and no separate platforms to manage, offering a better cost savings
- > MDM platform proliferation (such as numerous customer and financial master data repositories) is prevented, which

eliminates master data duplication throughout the enterprise

> Active data warehouse integration methods such as extract, transform and load (ETL), and enterprise application integration (EAI) tools can be leveraged

> The data architecture is simplified, reducing the total cost of ownership

> Master data management is a key enabler of enterprise analytics, as it is aligned with Teradata analytic solutions

> Skill sets within the EDW environment are utilized, such as data management, consolidation, cleansing and integration

> Existing EDW data governance, ownership methodologies and rules enable continuity within the organization

> The platform is enterprise-data focused

> Teradata is truly scalable technology

Teradata provides a complete data warehousing environment including the leading EDW platform, applications and services. Teradata recently announced its own Teradata MDM solution which is composed of core MDM services (discussed in this article) and vertically specific solutions built on top of those core services. Today, Teradata brings to market a product-focused vertical (PIM) solution, and plans are in the works to build out other vertical-specific solutions, such as ones covering CDI.

Though Teradata provides its own MDM solution, the company will continue to partner with other MDM providers and encourage them to port their technology to Teradata. In those cases where the customer has decided to deploy the MDM repository outside of the EDW, Teradata will ensure that the EDW is effectively integrated into the MDM architecture. **T**

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Master data management (MDM) capabilities

Manage data architecture and metadata

Manage data models, business rules and metadata on ownership, sources, usage standards and systems of record, origin and reference

Author and extend master data

Add or extend master data records to replace or augment systems of record (e.g., UCCnet requirement to publish "% recycled material" not available in any system but must be centrally managed and synchronized with other systems)

Manage data quality and cross-referencing

Maintain data integrity for accuracy and completeness, and link data in different formats to common standard (e.g., standardize/clean multiple ZIP code schemes; rationalize part numbers for planning)

Synchronize master data

Propagate state and change of data and attribute content to source/destination systems (e.g., centralize global customer and product master data from local systems, ensure local copies synchronized with global data and retain local ownership of local data)

Manage master data workflows

Develop end-user applications to manage master data processes (e.g., new product introduction, customer retirement)